AMENDED CLAIMS

What is claimed is:

1. (currently amended) A method of determining a ~~resistivity~~ parameter of a bed boundary in an earth formation using a logging tool within a borehole penetrating said earth formation, said bed boundary being away from the borehole, the method comprising:

   (a) obtaining a plurality of first measurements indicative of said parameter of said bed boundary with a ~~resistivity~~ first sensor on the logging tool ~~indicative of said parameter of interest~~ at a plurality of rotational positions of the logging tool, said ~~resistivity~~ first sensor having a substantially uniform azimuthal response characteristic; and

   (b) determining said ~~resistivity~~ parameter of said bed boundary from said first measurements made by said ~~resistivity~~ first sensor at a spatial position that is not at the center of said borehole.

2. (currently amended) The method of claim 1 further comprising:

   (i) making second measurements with an orientation sensor indicative of a toolface angle of said logging tool at said plurality of rotational positions;

   (ii) using at least one additional sensor to make third measurements indicative of said spatial position ~~of said logging tool relative to the center of said borehole~~ at said plurality of rotational positions; and

(iii) determining from said second and third measurements said spatial position ~~of said reisistivity sensor~~.

3. (original) The method of claim 2 wherein said orientation sensor comprises a magnetometer.

4. (original) The method of claim 3 wherein said magnetometer comprises a two-component magnetometer.

5. (original) The method of claim 2 wherein said at least one additional sensor comprises two additional sensors.

6. (currently amendedl) The method of claim 5 wherein said at least two additional sensors comprise ~~an~~ x- and ~~a~~ y- component ~~accelerometer~~ accelerometers.

7. (currently amended) The method of claim 2 wherein determining said spatial position further comprises determining expected values of said third measurements at said plurality of rotational positions using said second measurements.

8. (currently amended) The method of claim 7 wherein determining said spatial position further comprises determining differences between said third measurements and said expected values.

9. (currently amended) The method of claim 8 wherein determining said spatial position further comprises performing an integration of said differences.

10. (original) The method of claim 9 wherein said integration further comprises a double integration.

11. (original) The method of claim 9 further comprising using a constraint for said double integration.

12. (original) The method of claim 11 wherein said constraint is based on a dimension of said borehole.

13. (original) The method of claim 11 wherein said constraint is based on a measurement made by a standoff sensor.

14. (currently amended) The method of claim 1 wherein said ~~resistivity~~ parameter of said bed boundary comprises at least one of (i) a position of ~~a bed~~ said bed

boundary in said earth formation, and, (ii) an orientation of ~~a bed~~ said bed boundary in said formation.

15. (currently amended) The method of claim 14 wherein determining said ~~resistivity~~ parameter of said bed boundary further comprises defining a region in said earth formation to which said resistivity sensor is responsive substantially independent of said spatial position of said logging tool.

16. (original) The method of claim 7 wherein determining said expected values further comprises using a sinusoidal curve fitting.

17. (currently amended) A measurement-while-drilling (MWD) tool for use in a borehole in an earth formation for determining a ~~resistivity~~ parameter of a bed boundary away from said borehole, ~~an earth formation~~ the MWD tool comprising:

(a) a ~~resistivity~~ first sensor having a substantially azimuthally uniform response function ~~for making~~ which makes first measurements at a plurality of rotational positions of the MWD tool indicative of said parameter ~~of interest~~ of said bed boundary ~~at a plurality of rotational positions of the MWD tool~~;

(b) an orientation sensor ~~for making~~ which makes second measurements indicative of a toolface angle of said MWD tool at said plurality of rotational positions;

(c) at least one additional sensor ~~for making~~ which makes third measurements indicative of a spatial position of said logging tool ~~relative to a center of said borehole at said plurality of rotational positions~~; and

(d) a processor ~~for determining~~ which determines from said second and said third measurements said spatial position of said logging tool.

18. (original) The MWD tool of claim 17 wherein said orientation sensor comprises a magnetometer.

19. (original) The MWD tool of claim 18 wherein said magnetometer comprises a two component magnetometer.

20. (currently amended) The MWD tool of claim 17 wherein said at least one additional sensor comprises ~~an~~ x- and ~~a~~ y- component ~~accelerometer~~ accelerometers.

21. (original) The MWD tool of claim 17 wherein said processor further determines expected values of said third measurements at said plurality of rotational positions using said second measurements.

22. (currently amended) The MWD tool of claim 21 wherein said processor further determines said spatial position by determining differences of said third measurements from said expected values.

23. (original) The MWD tool of claim 22 wherein said processor further performs a double integration of said differences.

24. (original) The MWD tool of claim 17 further comprising a standoff sensor for determining an offset of the tool from a borehole wall.

25. (currently amended) The MWD tool of claim 17 wherein said processor determines said ~~resistivity~~ parameter of said bed boundary based on said determined position.

26. (currently amended) The MWD tool of claim 25 wherein said ~~resistivity~~ parameter of said bed boundary comprises at least one of (i) a position of ~~a bed~~ said bed boundary in said earth formation, and, (ii) an orientation of ~~a bed~~ said bed boundary in said formation.

27. (currently amended) The MWD tool of claim 25 wherein said processor further determines a region in said earth formation to which said ~~resistivity~~ sensor is responsive independent of said spatial position of said logging tool.

28. (currently amended) A system for determining a ~~resistivity~~ parameter of a bed boundary away from a borehole in an earth formation, the system comprising:

(a) a bottom hole assembly (BHA) including a device for penetrating said earth formation;

(b) a conveyance device for conveying said BHA into said earth formation;

(c) a ~~resistivity~~ first sensor on said BHA having a substantially azimuthally uniform response function ~~for making~~ which makes first measurements indicative of said parameter of ~~interest~~ said bed boundary at a plurality of rotational positions of the BHA;

~~(b)~~ (d) an orientation sensor on said BHA ~~for making~~ which makes second measurements indicative of a toolface angle of said BHA at said plurality of rotational positions;

~~(c)~~(e) at least one additional sensor on said BHA ~~for making~~ which makes third measurements indicative of a spatial position of said ~~logging tool~~ BHA relative to a center of said borehole at said plurality of rotational positions; and

~~(d)~~ (f) a processor on said BHA ~~for determining~~ which determines from said first, second and ~~said~~ third measurements said ~~resistivity~~ parameter of said bed boundary.

29. (original) The system of claim 28 wherein said orientation sensor comprises a two-component magnetometer.

30. (currently amended) The system of claim 29 wherein said at least one additional sensor comprises ~~an~~ *x*- and ~~a~~ *y*- component ~~accelerometer~~ accelerometers.

31. (original) The system of claim 28 wherein said processor further determines expected values of said third measurements at said plurality of rotational positions using said second measurements.

32. (currently amended) The system of claim 31 wherein said processor further determines said spatial position by determining differences of said third ~~measurements from said expected values~~.

33. (original) The system of claim 32 wherein said processor further performs a double integration of said differences.

34. (currently amended) The system of claim 28 wherein said processor determines said ~~resistivity~~ parameter of said bed boundary based on ~~said determined~~ a determination of said spatial position.

35. (currently amended) The system of claim 34 wherein said ~~resistivity~~ parameter of said bed boundary comprises at least one of (i) a position of a bed boundary in said earth formation, and, (ii) an orientation of a bed boundary in said formation.

36. (original) The system of claim 28 wherein said conveyance device comprises a drillstring.

37. (currently amended) The system of claim 28 wherein said device for penetrating said earth formation comprises a drillbit.

38. (new) The method of claim 1 wherein said first sensor comprises a resistivity sensor.

39. (new) The MWD tool of claim 17 wherein said first sensor comprises a resistivity sensor.

40. (new) The system of claim 28 wherein said first sensor comprises a resistivity sensor.